

THE FACTS

Information About
Environmental Cleanup
at McClellan AFB.

Produced by McClellan AFB Environmental Management

Number 16

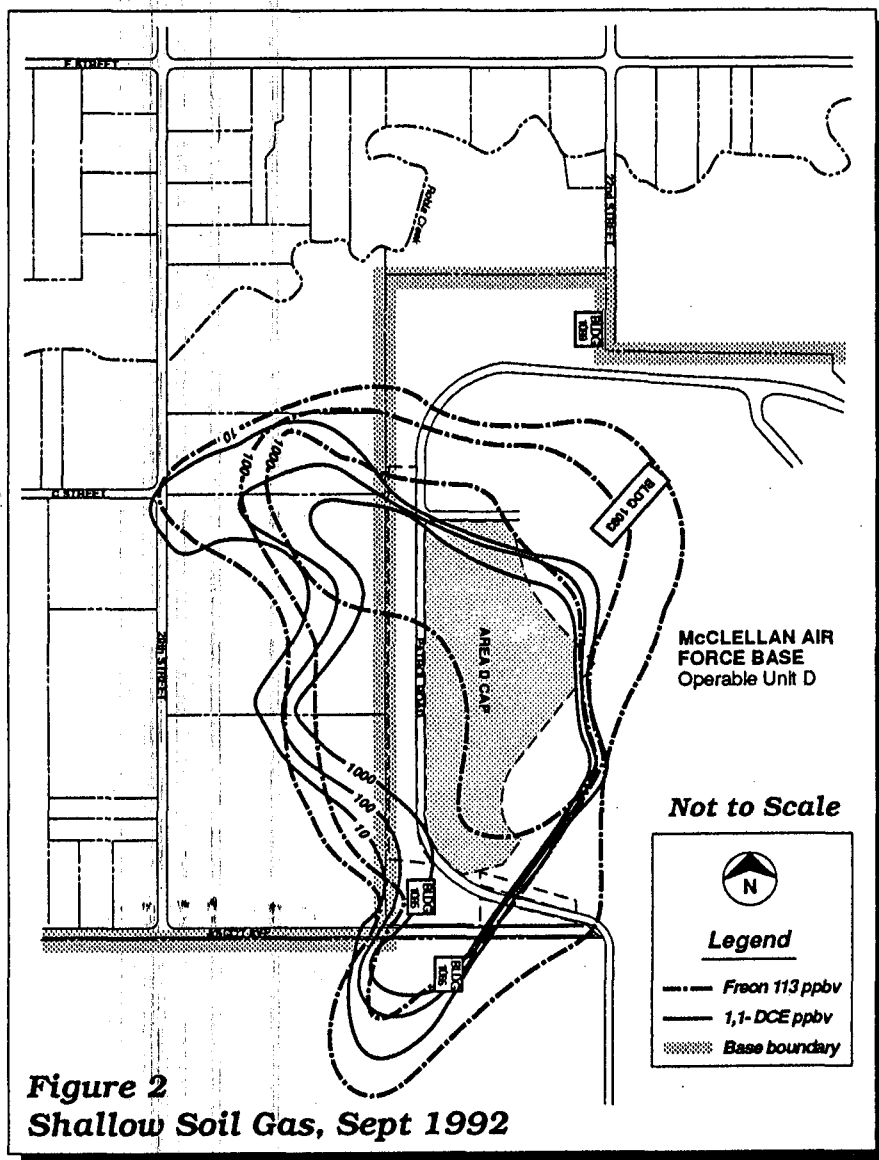
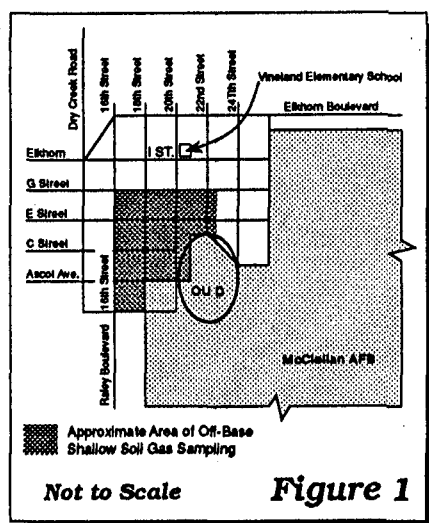
Off-Base Soil Gas Sampling in OU D Results Show Shallow Contamination is Limited in Extent

Results are now available from the McClellan Air Force Base (AFB) shallow soil gas sampling program conducted last fall in and near Operable Unit (OU) D. Off-base contamination in shallow soil gas (the air spaces between soil particles), 5 to 10 feet below the ground surface, was determined to be limited to the area east of 20th Street, close to the historical base waste disposal pits in OU D.

Shallow soil gas sampling was conducted to determine if contaminated soil gas has moved from old waste disposal pits on the base to residential areas to the north and west of the base or to on-base buildings. The purpose of the study was to collect soil gas samples in a broad area near OU D to determine if soil gas contaminants are moving at shallow depths, and if so, how far they have moved. The results of the study are being used to support further studies of potential risks to human health and methods to clean up the contamination.

Prior to conducting any of the off-base sampling, McClellan AFB obtained permission for access from property owners in the area. Shallow soil gas sampling was conducted at 300 foot intervals progressing outward from the base boundary, away from OU D. Sampling continued only as long as contaminants were detected. Permission to sample was originally requested for over 200 locations, but only a fraction of these locations required sampling because the shallow soil gas contamination was generally limited to the parcels closest to the base property line.

Figure 1 shows the extent of the area originally targeted for sampling.



What are the Sampling Results?

From September 23 to October 7, 1992, shallow soil gas was sampled at 28 locations within OU D and 42 locations in the surrounding residential area. The samples were taken using a pickup truck equipped with a gas probe to collect samples and a mobile laboratory for analysis. The samples were taken from 5 to 10 feet below ground surface.

Soil gas samples collected in the study were analyzed for approximately 20 different volatile organic compounds (VOCs). VOCs are chemical compounds, often petroleum byproducts, that evaporate (volatilize) readily at room temperature. The VOCs in contaminated soil gas originate from fuel and solvent wastes disposed in the soil in past years. The contaminants can move through the air spaces between

particles of soil and rock.

The results indicate that concentrations of VOCs in shallow soil gas decrease rapidly as the distance from OU D increases. The concentrations decrease by several orders of magnitude within 150 feet of the base boundary and are nondetectable beyond 300 feet. Freon 113 and 1,1-dichloroethene (1,1-DCE) were the most prevalent compounds detected in the shallow soil gas. Figure 2 maps the concentrations measured for these substances in parts per billion by volume (ppbv), and shows how the concentrations decrease as the distance from OU D increases. These data will be used in the Remedial Investigation/Feasibility Study (RI/FS) for OU D to evaluate potential human health risks and to identify cleanup methods and cleanup levels.

What Results are Available from Crawlspace and Ambient Air Sampling?

Crawlspace and ambient air sampling were conducted in June 1992, September 1992, and February 1993 at four residences located west of OU D, along 20th Street and Ascot Avenue. Crawlspace sampling involved taking samples in basements and underneath houses; ambient air sampling involved measuring the air outside these four residences. Results indicate that the concentrations of VOCs in crawlspaces under houses adjacent to the base are not different from the concentrations typically found in ambient air in Sacramento. **Therefore, there is no indication at this time that residents are being exposed to VOCs originating from soil gas.** The human health risks associated with VOCs detected in the air samples are no different from the risks ordinarily experienced by residents in the Sacramento area.

Vinyl chloride was not detected in any of the sampling efforts. For detected VOCs, there are no distinct differences between ambient air and crawlspace results, or in results for the different residences. An exception was higher concentrations of 1,1,1-trichloroethane (1,1,1-TCA) measured in ambient air outside one residence in June 1992. The elevated concentrations in June 1992 were only detected during one sampling event and are not recurring. Further sampling in September 1992 and February 1993 showed noticeable decreases in 1,1,1-TCA levels in both crawlspace and ambient air samples. Crawlspaces and ambient air will continue to be monitored on a quarterly basis.

Why Study Soil Gas?

The VOCs in contaminated soil gas originate from past disposal of fuel and solvent wastes in soil. The contaminants can move vertically and horizontally under the ground through air spaces between particles of soil and rock. Contaminants in the shallow soil gas are being studied because if they continue to move, they could eventually evaporate from the surface of the soil either into the ambient (outdoor) air, or into the crawlspaces under houses. Therefore, in addition to shallow soil gas sampling, the current McClellan AFB study includes quarterly residential crawlspace and ambient air sampling on the parcels near the base that have elevated shallow soil gas concentrations. Additionally, more wells will be drilled this year to study deeper soil gas, 40 to 90 feet below the ground surface, and determine if the soil gas contaminants are moving deeper in the ground.

Why is More Deep Soil Gas Sampling Proposed?

As indicated, McClellan AFB will be drilling more wells this year to determine if soil gas is moving deeper in the ground (i.e., 40 to 90 feet below ground surface). Deep soil gas sampling was conducted in June 1992, September 1992, and February 1993 at nine soil vapor monitoring wells on the perimeter of the west side of OU D. The nine wells are in clusters of three and are screened in depths from 11 to 79 feet below ground surface (bgs). Several of the VOCs were detected and vinyl chloride was detected in the deeper zones, along the perimeter of OU D.

Although the shallow soil gas results assist in identifying areas for deeper soil gas sampling, they are limited as an indicator of deeper soil gas

contamination. There is little correlation between the shallow and deep soil gas concentrations measured to date. For this reason, McClellan AFB will continue the deep soil gas sampling program to identify areas for remedial action.

What is Being Done to Clean Up the Soil Gas?

The long term plan is to clean up the source of the contamination problem and remove the soil gas from the ground. As described in *The Facts*, No. 13, a soil vapor extraction (SVE) system has been designed and is now operating in OU D to remove VOCs from the contaminated soil and destroy them in an emission control system. Results from initial testing and startup indicate that approximately 28,000 pounds of VOCs were removed from the site during the period March 15 through April 9, 1993. The predominant contaminants removed included 1,1,1-TCA, 1,1-DCE, trichloroethene (TCE), and Freon 113. Sampling is also being conducted to determine how effective the system is in collecting and eliminating the soil gas

plume. The results will be used to decide if an expanded SVE system should be installed and operated.

Next Steps

McClellan AFB will continue conducting crawlspace and ambient air sampling, as well as the deep soil gas sampling. The results from the sampling efforts are being used to develop a report called a Remedial Investigation/Feasibility Study (RI/FS). An RI/FS is a two-part study of hazardous waste contamination that must be completed before a cleanup remedy is chosen and implemented. The first part, the Remedial Investigation, examines the nature and extent of contamination, and presents the results of the human health risk assessment. The second part, the Feasibility Study, identifies and evaluates alternatives for addressing the contamination. The Draft Remedial Investigation for OU D is expected to be completed in April 1994. Members of the public will be notified when copies are available for review and comment; the public comment period is currently scheduled for July to August 1994.

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